



Inter-disciplinary insights into learning via inter-actional research

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Higher education research on the student learning experience has drawn heavily on student and faculty perception studies. Our interdisciplinary team studying problem-based learning (PBL) in undergraduate health sciences is drawing on the strengths of our respective paradigms (educational sociology, educational psychology, sociolinguistics and health sciences education) to create new forms of collaborative, inter-actional research. The team's goal is to explore *Science of Learning* questions about learning across multiple levels of scale.

Recently funded under Hong Kong's General Research Fund, we are excited to undertake HKU's first cross-faculty (Medicine, Dentistry and Speech & Hearing Sciences) educational research project on PBL in health sciences education, and to be the first to extensively apply a video-based, inter-actional approach in this field. Our goal is that, through our interdisciplinary teamwork, each specialist will contribute particular knowledge to create new trans-disciplinary understandings of fundamental phenomena involved in learning and curriculum design.

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A core focus is our common interest in the role of educational technologies for 21st century learners in clinical education. The team's respective hands-on experience in designing and implementing technological innovations (learning management systems; interactive whiteboards and plasma screens; video patient cases; mobile devices; online, asynchronous PBL) has further stimulated our research interest into their effects on student

learning. A recent systematic review on educational technologies in PBL in health sciences indicated few empirical studies in the field, but found trends that such technologies can support the development of medical expertise through the accessing and structuring of expert knowledge and skills, and by making disciplinary thinking and strategies explicit.

A key question we have been exploring at HKU is the consequential and cumulative nature of learning in PBL contexts. Our work to date has been mapping the inter-actional processes in which students are creating and constructing knowledge. In doing so, we have been able to establish the consequential nature of technology-infused designs to knowledge building across events within a single problem cycle. The challenge we are now taking up, with support, is one of scalability. We seek to explore how learning occurs over time, i.e. across the years of an integrated health sciences curriculum, and across contexts, i.e. from PBL discussions to clinical reasoning. In addressing this phenomenon, we aim not only to build new theoretical understandings of PBL in an information-saturated age, but also to address practical, applied issues regarding PBL facilitation, curriculum design, evaluation and research design.

Methodologically, our team's adoption of an Inter-actional Ethnography (IE), first developed at the University of California, Santa Barbara (UCSB) in primary school literacy studies and now found in diverse educational research areas, is novel to health sciences education. With its foundations in educational ethnography, IE analysis offers opportunities to address two limitations often associated with qualitative methods – scalability and direct evidence. Drawing on a video archive of PBL interactional data, the IE methodology will enable systematic documentation of classroom discourse with analysis enabling us to trace and map how PBL collaborative knowledge building is consequential to clinical learning. Our discipline-based co-investigators are fascinated by the analytic moment when a student's or group's thought processes become visible through the methodology.

Such collaborative research provides a dynamic paradigm of looking at the same phenomena from different angles so that we can systematically bring forward the ways of thinking about and talking about what each discipline sees in order to uncover the layers of work that students do. The potential of our analyses is to make visible what is often invisible or taken for granted, and build both inter-disciplinary and trans-disciplinary understanding of fundamental phenomena and processes of learning.